The Principle of Preserving Outflow Structures in Partial ALPPS: a commentary on "Segment 4: A Key Point of ALPPS Procedure"

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Reply:

The authors reported their experience in six patients undergoing partial associating liver partition and portal vein ligation for staged hepatectomy (ALPPS) for hepatocellular carcinoma (HCC) in cirrhosis (n = 5) and colorectal liver metatstases (n = 1). All patients had partial transection of at least 50% at stage one surgery and developed rapid hypertrophy after a median time of 7 days. No severe interstage complications were observed and stage two hepatectomy was completed after a short interstage interval. They exemplified the importance of partial ALPPS on preserving outflow structures in one case where tumor involvement of the middle hepatic vein occurred. Using the technique of partial transection at stage one, efficient and rapid hypertrophy was achieved without approaching the critical area. At stage two surgery, completion hepatectomy with resection of the tumor involving the middle hepatic vein was performed and the middle hepatic vein was reconstructed in order to prevent necrosis of segment 4.[1]

Partial ALPPS is a less invasive variant of ALPPS in which the future transection plane is partially divided at stage one surgery.[2] This report contributes to the growing body of evidence that partial ALPPS is effective in inducing rapid hypertrophy and appears associated with a favorable interstage and post-stage two complication profile.[1,3,4] We agree with the authors[1] and others[5] that preservation of venous drainage is of paramount importance for providing an optimal regenerative environment of segment 4. Outflow obstruction after stage one surgery can impair regeneration[5,6] and might result in congestion and necrosis.[7] These events might potentially trigger major septic complications during the interstage course. The association of partial partition with preservation of the middle hepatic vein and favorable postoperative outcome has been also independently reported for patients undergoing ALPPS for colorectal liver metastases.[3] The beneficial principle of outflow preservation has been shown in the literature for liver surgery[5,7] and living-donor liver transplantation.[8] In contrast to ALPPS, partial ALPPS offers a technique that preserves central outflow structures and avoids potential intraoperative complications caused by approaching these structures at stage one surgery. Furthermore, the exemplified case in the current letter shows that partial ALPPS is a better technique to deal with difficult tumor locations that involve major outflow structures and are localized in the future transection plane.

Another important aspect of the letter applies to cirrhotic patients with HCC. Previous series of partial ALPPS have been exclusively reported in patients with colorectal liver metastases.[3,4] Despite the low-case number of five cirrhotic patients with HCC, the present letter reports the use of partial ALPPS in this high-risk population for the first time. Although the authors did not provide detailed information on demographics and hypertrophy, the less invasive ALPPS variant with partial transection appears also to work in cirrhotic patients with HCC. In addition, this technique was associated with zero mortality. A recently published study on ALPPS in intermediate-stage HCC demonstrated that ALPPS induced rapid hypertrophy but was associated with a 31% 90-day mortality rate.[9] In addition, high-grade fibrosis and cirrhosis were associated with poor hypertrophy and kinetic growth in that study.[9] In the view of these observations, partial ALPPS might be a safer technique especially in patients with HCC and diseased liver parenchyma.

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